

ABSTRACT OF THE INVENTION

This invention provides an aqueous/t-butanol solvent-system, facile reconstitute, submicron-reconstitute preliposome-lyophilized and method of its preparation and use.

In one embodiment this entails a modified method for the preparation of a submicron and stable liposome formulation of the non-cross-resistant anthracycline Annamycin is described. The optimal lipid composition was DMPC:DMPG at a 7:3 molar ratio and the optimal lipid:drug weight ratio 50:1. The selected formulation is a preliposome lyophilized powder that contains the phospholipids, Annamycin, and 1.7 mg Tween 20 per mg of Annamycin. The liposome suspension is obtained on the day of use by adding normal saline at 37°C (1 ml per mg Annamycin) and hand-shaking for one minute. The presence of Tween 20 is essential in shortening the reconstitution step (from > 2 hours to 1 minute), avoiding the early formation of free drug crystals, and reducing the median particle size (from 1.5 μm to 0.15-0.20 μm) without destruction of the liposome vesicles. The chemical stability of the preliposome powder at room temperature was > 3 months and the chemical and physical stability of the liposome suspension at room temperature > 24 hours. The in vitro cytotoxicity of the formulation was equivalent to that prepared by the standard evaporation method. The results of the study indicate that small amounts of surfactant may be used to enhance the reconstitution step and reduce the liposome size of lyophilized liposome formulations of lipophilic drugs.